

REMARKS

In response to the restriction requirement dated October 18, 2007, claims 1-16, 18-22, 23-32, 34-38, and 40-73 were withdrawn and therefore canceled. Claims 17, 23, 33 and 78 have been amended. New claim 96 has been added for consideration. Support for new claims 96 and 97 can be found in the specification as filed, e.g. [0022], [0025] and [0157]. Claims 17, 23, 33 and 74-97 are currently pending.

Claim Objection

Claim 33 was objected to for informalities. Claim 33 has been amended to delete the word "a".

Withdrawal of the objection to claim 33 is therefore respectfully requested.

Claim Rejections- 35 USC §112

Claim 78 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 78 has been amended to be dependent on claim 23.

Withdrawal of the rejection to claim 78 under 35 U.S.C. § 112, second paragraph is therefore respectfully requested.

Claim Rejections- 35 USC §101

Claims 17, 23, 33 and 74 to 95 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Office Action alleges that "the claimed invention is not directed to a practical application of such judicial exception in that the claimed invention does not require any physical transformation and does not produce a useful, concrete, and tangible result." See Office Action, page 3, fourth full paragraph under section heading "Claim

Rejections-35 USC § 101.

Claim 17 has been amended to recite “generating a volatility value based upon the monthly cash indices over at least one year as a measure of historical performance.” Therefore, Applicant respectfully submits that claim 17 as amended is directed towards a practical application of the “generating a volatility value” which may be used as a “measure of historical performance.”

Both claims 23 and 33 have been amended to recite “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market.” Therefore, Applicant respectfully submits that claims 23 and 33 as amended are directed towards a practical application of the “daily cash index” which is “usable as a daily settlement value in a real estate based securities market.”

Withdrawal of the rejections under 35 U.S.C. § 101 to claims 17, 23, 33 and 74 to 95 is respectfully requested.

Claim Rejections- 35 USC §103

Claims 17, 23, 33, 78-81, 86, 91, 92, and 95 were rejected under 35 U.S.C. 103(a) as being unpatentable over Florance, et al (U.S. Publication No. 2002/0065739) in view of Kevenides (“International Real Estate Investment Risky Analysis,” Real Estate Issues, Chicago: Fall 2002. Vol. 27, Issue 3/4; pg. 61, 13 pgs.).

The Florance et al. patent (U.S. Publication No. 2002/0065739) describes “a system and method for creating a unified commercial real estate data model through collection, distribution and use of information in connection with commercial real estate and a web-based marketplace that facilitates the buying and selling of commercial properties.” See Florance, page 3, paragraph [0036].

The Kevenides publication describes “three approaches to calculating value at risk.” See Kevenides, page 3, full paragraphs 3 to 5.

Claim 23:

Independent claim 23 of the present invention recites:

23. A method for providing a daily cash index for real estate transaction values, comprising:

- a. for each day, performing a survey of actual real estate transactions executed on said day in a local region;
- b. for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market.

Applicants respectfully submit that the Florance patent describes “a system and method for creating a unified commercial real estate data model through collection, distribution and use of information in connection with commercial real estate and a web-based marketplace that facilitates the buying and selling of commercial properties”, however, the Florance patent does not disclose “a method for providing a daily cash index for real estate transaction values” as recited in independent claim 23 of the present invention. Applicants respectfully submit that the Florance patent describes a system of data collection and distribution. Building and updating a database as described in the Florance patent is not utilization of the information maintained in a database to generate an index on a daily basis. As the building and updating of a database is not “generating a daily cash index”, Applicants respectfully submit that the Florance patent does not in any way show or teach “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market” as recited in independent claim 23 of the present invention.

The Office Action asserts that:

[r]egarding claims 17 and 23, Florance teaches...b. each day, generating a daily cash index of commercial real estate/real estate transaction values in the local region based upon the survey [see paragraph 0052-clients receive daily service updates; paragraph 0105. Examiner interprets creation of indexes as similar to Applicant’s generating a daily cash index]

See Office Action, page 4, sixth full paragraph through page 5, , lines 1 to 2.

Applicant respectfully submit that paragraphs [0052] and [0105] of the Florance patent state:

[0052] The system uses linked databases and computers to provide a wide array of digital service offerings including a leasing marketplace, a selling marketplace, decision support, tenant information, comparable sales information, property marketing, and industry news. All of these services are preferably digitally delivered and most clients receive daily service updates over the Internet.

[0105] The invention also provides a method and system for listing and brokering a commercial real estate and its financial derivatives. In particular, the system of the present invention can be used in connection with the creation of financial derivatives for commercial real estate. To create these derivatives, one must have a source of comprehensive information. The system of the present invention supports derivatives for commercial real estate by providing sufficiently accurate market information that supports the creation of indexes and derivatives such as futures or hedge rental rates and occupancy rates. The system can also be used for underwriting and rating commercial mortgage banking securities.

Applicants respectfully submit that there is no support that the “daily service updates over the Internet” as described in paragraph [0052] of the Florance patent is in any way a teaching of the generation of “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market” as recited in claim 23 of the present invention. The daily service updates of the Florance patent appear to merely relate database updates in support of a “wide array of digital service offerings including a leasing marketplace, a selling marketplace, decision support, tenant information, comparable sales information, property marketing, and industry news” as described in paragraph [0052] of the Florance patent. However, none of “a leasing marketplace, a selling marketplace, decision support, tenant information, comparable sales information, property marketing, and industry news” as described in Florance is a “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market” as recited in claim 23 of the present invention. Therefore, the assertion in the Office Action that “[r]egarding claims 17 and 23, Florance teaches...b. each day, generating a daily cash index of

commercial real estate/real estate transaction values in the local region based upon the survey [see paragraph 0052-clients receive daily service updates; paragraph 0105. Examiner interprets creation of indexes as similar to Applicant's generating a daily cash index]" is unsupported. The Florance patent does not show or teach "for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market" as recited in claim 23 of the present invention.

The Florance patent describes a data collection and distribution system that "supports derivatives for commercial real estate by providing sufficiently accurate market information that supports the creation of indexes and derivatives such as futures or hedge rental rates and occupancy rates." See Florance, paragraph [0105]. Applicants respectfully submits that the collection and distribution of data for a database is not "for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market" which may be used to fix and settle cash derivative positions in a financial marketplace.

Moreover, the known indices prior to the present invention were generated on a monthly basis. Applicant refers to a publication entitled "S&P/Case-Shiller® Home Price Indices", a copy of which is attached to this Response as Appendix A. As noted in the attached, the "S&P/Case-Shiller® Home Price Indices measures the residential housing market, tracking changes in the value of the residential real estate market in 20 metropolitan regions across the United States." See Appendix A, "S&P/Case-Shiller® Home Price Indices", first full paragraph. The S&P/Case-Shiller® Home Price Indices "use the repeat sales pricing technique to measure housing markets." See Appendix A, "S&P/Case-Shiller® Home Price Indices", first full paragraph. The S&P/Case-Shiller® Home Price Indices family "consists of 20 regional indices and two composite indices as aggregates of the regions." See Appendix A, "S&P/Case-Shiller® Home Price Indices", first full paragraph.

Applicant notes that the S&P/Case-Shiller Home Price Indices are calculated monthly. See Appendix A, "S&P/Case-Shiller® Home Price Indices", second full paragraph.

Therefore, Applicant respectfully submits that the state of the art at the time of the present

invention was to calculate monthly indices as in the Case Shiller Indices and not “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey” as recited in independent claim 23 of the present invention.

Lastly, a benefit of generating a daily cash index is the ability to fix and settle derivative positions on a daily basis thus providing for fluidity in the financial marketplace. This is evidenced in a review entitled “Morgan Stanley: Property Derivatives Insights: Pure Play on residential Realty” which was published by a financial services provider which discusses a commercial embodiment of the present invention, the “Residential Property Index (“RPX”), which is presently marketed by the Applicant. A copy of the review entitled “Morgan Stanley: Property Derivatives Insights: Pure Play on residential Realty” is attached to this Response as Appendix B. As noted in the attached review which compares RPX to other housing indices generated on a monthly basis, including the Case-Shiller Home Price Index, RPX:

[r]epresents daily transactions from 25 U.S. metropolitan statistical areas on a price per square foot measure. In our view, RPX emerges as the best tradable index among the different alternatives.”

See Morgan Stanley: Property Derivatives Insights: Pure Play on residential Realty, page 1, section “RPX Has Arrived”.

For the foregoing reasons, withdrawal of the Examiner’s rejection of independent claims 17, 23 and 33 and dependent claims 78-81, 86, 91, 92, and 95 is respectfully requested.

Claims 17 and 33

Independent claims 17 and 33 of the present invention recite:

17. A method for providing a daily cash index for real estate transaction values, comprising:

- a. for each day, performing a survey of actual real estate transactions executed on said day in a local region;
- b. for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market;

- c. for each month, aggregating the daily surveys to generate a monthly cash index;
- d. generating a volatility value based upon the monthly cash indices over at least one year as a measure of historical performance.

33 A method for providing a daily cash index for real estate transaction values, comprising:

- a. based upon historical data, generating monthly cash indices of real estate values in a local region for each month of at least 10 prior years;
- b. generating an initial volatility value based upon the monthly cash indices over said at least 10 prior years;
- c. for each day, performing a survey of actual real estate transactions executed on said day in the local region;
 - a. for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market;
 - b. for each month, aggregating the daily surveys on a monthly basis to generate a monthly cash index for said each month; and
- d. updating the volatility value based upon each monthly cash index generated in step c.

As discussed above, the Florance patent describes a system and method for creating a unified commercial real estate data model through collection, distribution and use of information in connection with commercial real estate and a web-based marketplace that facilitates the buying and selling of commercial properties. The Kevenides publication describes three approaches to calculating value at risk. However, neither the Florance patent nor the Kevenides publication disclose “a method for providing a daily cash index for real estate transaction values” as recited in independent claims 17 and 33 of the present invention. As discussed above with respect to claim 23, the Florance patent describes a system of data collection and distribution which is not “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and

usable as a daily settlement value in a real estate based securities market” as also recited in independent claims 17 and 33 of the present invention.

Kenevides describes the concept of calculating and analyzing Value At Risk (VAR). Kenevides describes that “Value at Risk (VAR) is the amount of money an institution could make or lose from changes in the price of the underlying assets.” See Kenevides, page 2, first full paragraph under the section heading “CALCULATING AND ANALYZING VALUE AT RISK”. Kenevides describes that “the VAR concept incorporates two central elements of risk: (1) the sensitivity of a portfolio to changes in underlying prices and (2) the volatility of the underlying prices. See Kenevides, page 2, first full paragraph under the section heading “CALCULATING AND ANALYZING VALUE AT RISK”. The Kenevides publication describes three approaches to calculating value at risk (VAR): 1) the correlation method; 2) the historical simulation approach and 3) the Monte Carlo simulation method.

None of the three approaches described in the Kenevides publication teach or show “for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market” as recited in claims 17 and 33 of the present invention. In the present invention, the monthly cash indices is being generated as an aggregate of the daily cash indices. As the Kenevides publication fails to teach or show generating a daily cash index of real estate transaction, Applicant respectfully submits that the Kenevides also fails to teach or show “generating a volatility value based upon the monthly cash indices over at least one year as a measure of historical performance” as recited in claim 17 of the present invention. Kenevides also fails to teach or show “for each month, aggregating the daily surveys on a monthly basis to generate a monthly cash index for said each month; and d. updating the volatility value based upon each monthly cash index generated in step e” as recited in claim 33 of the present invention. Therefore, Kenevides fails to cure the defect of the Florance patent as described above.

For the foregoing reasons, withdrawal of the Examiner’s rejection of independent claims 17 and 33 and dependent claim 91 is respectfully requested.

Rejection of claims 74, 75, 77, 82, 83, 85, 87, 88, 90, 93 and 94

Claims 74, 75, 77, 82, 83, 85, 87, 88, 90, 93 and 94 were rejected under 35 U.S.C. 103(a) as being unpatentable over Florance, et al (U.S. Publication No. 2002/0065739) in view of Kevenides ("International Real Estate Investment Risky Analysis," Real Estate Issues, Chicago: Fall 2002. Vol. 27, Issue 3/4; pg. 61, 13 pgs.) as applied to claims 17, 23, and 33 and further in view of Official Notice.

The Florance patent and the Kenevides publication are discussed above with respect to independent claims 17, 23 and 33.

In view of the comments above with respect to independent claims 17, 23 and 33, withdrawal of the rejections to dependent claims 74, 75, 77, 82, 83, 85, 87, 88, 90, 93, and 94 under §103(a) is respectfully requested.

Rejection of claims 76, 84 and 89

Claims 76, 84, and 89 were rejected under 35 U.S.C. 103(a) as being unpatentable over Florance, et al (U.S. Publication No. 2002/0065739) in view of Kevenides ("International Real Estate Investment Risky Analysis," Real Estate Issues, Chicago: Fall 2002. Vol. 27, Issue 3/4; pg. 61, 13 pgs.) as applied to claims 17, 23, and 33 above, and and further in view of Hoadley ("Options Strategy Analysis Tools", website www.hoadley.net/options/BS.htm. December 18, 2002.

The Florance patent and the Kenevides publication are discussed above with respect to independent claims 17, 23 and 33.

The Hoadley reference describes an Options Strategy Evaluation Tool which "enables you to construct and evaluate various strategies made up of combination of trades in puts and calls plus trades in the underlying asset." See Hoadley, page four, second full paragraph under section heading "Options Strategy Evaluation".

As Hoadley does not teach or show "for each day, generating a daily cash index of real estate transaction values in the local region based upon the survey, the daily cash index being expressed as a price per unit and usable as a daily settlement value in a real estate based securities market" as recited in claims 17, 23 and 33 of the present invention, the Hoadley reference fails to cure the defect

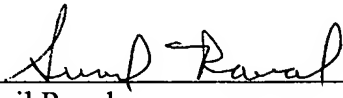
of the Florance patent and Kenevides publication as discussed above.

In view of the comments above with respect to independent claims 17, 23 and 33, withdrawal of the rejections to dependent claims 76, 84, and 89 under §103(a) is respectfully requested.

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,
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Appendix A

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Indices

S&P/Case-Shiller® Home Price Indices

[Overview](#)[Index](#)[News](#)[Data](#)
Description

The S&P/Case-Shiller® Home Price Indices measures the residential housing market, tracking changes in the value of the residential real estate market in 20 metropolitan regions across the United States. These indices use the repeat sales pricing technique to measure housing markets. First developed by Karl Case and Robert Shiller, this methodology collects data on single-family home re-sales, capturing re-sold sale prices to form sale pairs. This index family consists of 20 regional indices and two composite indices as aggregates of the regions.

The S&P/Case-Shiller Home Price Indices are calculated monthly and published with a two month lag. New index levels are released at 9am Eastern Standard Time on the last Tuesday of every month.

In addition, the S&P/Case-Shiller® U.S. National Home Price Index is a broader composite of single-family home price indices for the nine U.S. Census divisions and is calculated quarterly.

Note: The S&P/Case Shiller Indices are calculated by Fiserv, Inc. In addition, Fiserv also offers indices covering thousands of zip codes and metro areas using the Case-Shiller methodology. For more information, please call 877-279-2272.

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This index is maintained by an Index Committee, whose members include Standard & Poor's, Fiserv and leading industry experts. It follows a set of published guidelines and policies that provide the transparent methodologies used to maintain the index.

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(QuickTime required)[S&P/Case-Shiller® Indices \(audio only 47:01\)](#)**November 27, 2007**[Web Cast Presentation](#)[Professor Robert Shiller and Dr. David Blitzer](#)[Downloadable Podcast](#)
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[S&P/Case-Shiller® Home Price Factsheet](#)

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[S&P/Case-Shiller® Home Price FAQ](#)

[February 26, 2008: S&P/Case-Shiller® U.S. National Home Price Values](#)

[April 29, 2008: Historical Values](#)

[April 29, 2008: S&P/Case-Shiller® Indices sale pair counts](#)

[April 29, 2008: S&P/Case-Shiller® Indices tiered price indices](#)

[April 29, 2008: \(Mirror Site\)](#)

[U.S. Housing Industry
\(audio only 47:01\)](#)

[Related Indices](#)

The S&P/GRA Commercial Real Estate Indices (SPCREX™) are designed to be a reliable and consistent benchmark for commercial real estate prices in the United States.

[S&P/GRA
Commercial Real
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\(SPCREX™\)](#)

Appendix B

September 21, 2007

Structured Credit

Property Derivatives Insights

Pure Play on Residential Realty

Historically, Limited Avenues for Expressing Direct Views on Housing: While there are a host of alternatives, they represent indirect measures of housing market trends and are for the most part, long only – not direct investments in housing, and largely devoid of geographic specificity. The advent of residential property derivatives trading as a pure play on housing is a big step towards alleviating this constraint.

RPX Has Arrived: Radar Logic Incorporated has launched the Residential Property Index from which futures, total return swaps, and other products can trade. It represents daily transactions from 25 U.S. metropolitan statistical areas on a price per square foot measure. In our view, RPX emerges as the best tradable index among the different alternatives. We describe RPX index mechanics and compare it with other indices of home prices. We also briefly describe the workings of the RPX total return swap.

Housing Is Not Always a One-Way Trade: Although at the national level, home prices have generally grown each year, there were pockets of the market that lost money from time to time. Dispersion of annual returns is wide, even in good years. Therefore, there could be many relative-value plays among different geographical areas.

Who Could Play in Housing: We think RPX based property derivatives offer long and short opportunities for a wide range of investors – hedge funds, asset managers, mortgage loan originators/servicers and home builders/developers. They offer diversification benefits to enhance returns as well as help manage risks. Ultimately, RPX provides an efficient way to express strong views on residential housing.

MORGAN STANLEY FIXED INCOME RESEARCH

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The Primary Analyst(s) identified above certify that the views expressed in this report accurately reflect his/her/their personal views about the subject securities/instruments/issuers, and no part of his/her/their compensation was, is or will be directly or indirectly related to the specific views or recommendations contained herein.

This report has been prepared in accordance with our conflict management policy. The policy describes our organizational and administrative arrangements for the avoidance, management and disclosure of conflicts of interest. The policy is available at www.morganstanley.com/institutional/research.

Please see additional important disclosures at the end of this report.

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Property Derivatives Insights

Pure Play on Residential Realty

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Everyone loves to talk about residential real estate, but expressing investment views directly on real estate from a long/short relative value perspective has always been challenging. At an individual level, the conventional wisdom was and still is simply to buy a house. Then trade up to a bigger house, and maybe make that house bigger still. Institutional investors' avenues for residential real estate exposure are much varied – ranging from investing in real estate funds, mortgages-backed securities, and stocks of homebuilders and mortgage lenders. A few aspects of these different ways to invest in real estate are worth noting. They are for the most part, long only; not all are direct investments in housing,¹ and they are largely devoid of geographic specificity. Thus, it is difficult to express investible views that exploit regional differences in housing markets.

Property derivatives trading seeks to address these gaping holes in the investment opportunity set for institutional investors. In this report, our first under this new flagship publication, we briefly introduce the backdrop of real estate in the U.S., explain the development of alternative housing indices, and focus on one, the Residential Price Index (RPX), which we expect to be the index on which many property derivatives will trade in the OTC market. With the rollout of RPX-based trading launched this week, we think it is important for all interested investors to understand the mechanics of residential home price indices and the specifics of historical housing performance to be able to effectively use these new products (and other upcoming ones).

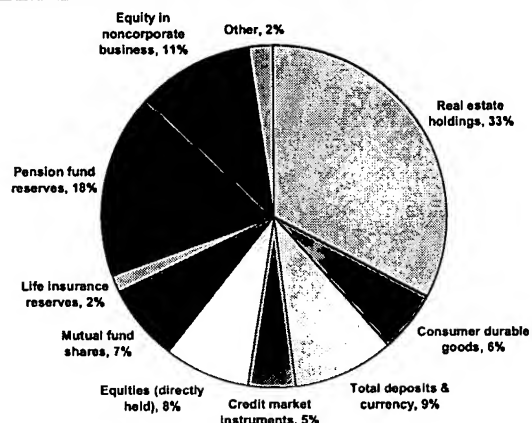
Housing Matters

Since 1965, homeownership percentages have climbed from 63% to 68%,² despite a dip in the 1985-1995 period. Thus, the nation's psychology, status, and infrastructure (not to mention tax policy) has increasingly favored homeownership over time. Consequently, real estate constitutes the single largest asset in the portfolios of the US household (Exhibit 1).

¹Other factors besides the value of homes can influence their performance.

²U.S. Census.

Exhibit 1
Largest Slice Deserves Much Attention



Source: Federal Reserve

The increase in mortgage applications and decline in interest rates combine to showcase the attractiveness of real estate buying and investing in the long run. Despite the tremendous growth in house prices, affordability has been maintained and only recently has shown signs of dipping.³ Median incomes have more than kept up pace to support monthly mortgage payments on the median house. Given this landscape, the importance of tradable residential real estate instruments is even more salient.

On the other hand, sub-prime related shocks continue to reverberate across the global financial system, far beyond the mortgage-backed securities and related structured products. While we think that the poor performance of recent sub-prime collateral pools is largely a result of lenient lending standards, the recent slowdown in home prices has not helped. As such, there has been an investor need to short housing.

Up until now, there was no direct tradable instrument to express views on residential real estate other than buying up large tracts of real estate (with no way to go net short). Obviously, such an investment that would require a large commitment in maintenance, taxes, and complicated unwinds. However, the current opportunity set offers, at best, indirect bets on housing.

³Housing Affordability Composite Index, National Association of Realtors.

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The Alphabet Soup of Indirect Housing Bets: ABS, ABS CDO, ABX and TABX

As noted earlier, a popular financial avenue to go long housing risk has been either through stocks related to the residential real estate sector (e.g., REITs) or by buying securities that are backed by residential mortgages of various types. ABS CDOs were another means of going long leveraged exposure to real estate. The latter took off in a big way since early 2003; we estimate the outstanding ABS CDO market to be in the \$550-600 billion range.

The advent of CDS on ABS through standardized documentation in July 2005 marked a significant new development: it opened up an attractive method for investors to go both long and short ABS risk. CDS on CDOs was a subsequent development essentially along similar lines. Macro hedge funds and others have used ABS CDS and CDS on CDOs as well as standardized indices like ABX and TABX to express strong negative views on sub-prime housing credit, with varying degrees of success.

We reiterate the indirect nature of the housing bet embedded in these instruments, whether going long or short. While home prices are undoubtedly integral to the performance of ABS and ABS CDO securities, several other pertinent factors come into play. Structural features unique to ABS and ABS CDOs (e.g., triggers, turbos, step-down, cash flow waterfall, over-collateralization spread, etc.) have substantial influence on their performance. The mortgage pools underlying ABS are, by definition, large geographically well-dispersed pools. Even though certain states like California and Florida dominate in many ABS pools, their weights are still too low to achieve desired geographic specificity. Further, ABS CDOs are typically managed pools with a CDO manager. Thus, security selection and trade timing have a significant impact on CDO performance. Finally, ABS CDOs involve sub-prime ABS and reflect only that residential segment. This is true also of ABX, TABX, and more generally ABS CDS – all pertaining to the sub-prime sector only, not the general housing sector.

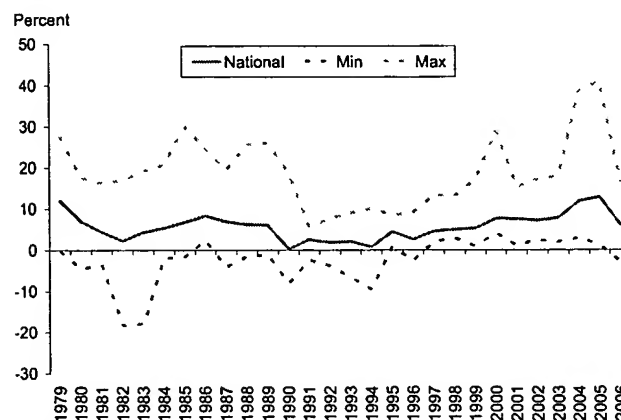
This alphabet soup was an imperfect and leveraged way to spell out “real estate.” An instrument whose performance mirrors only residential real estate prices would be better. However, given that homes are disparate assets (even in cookie-cutter neighborhoods), we need standardized indices whose performance is tied solely to home prices and are geographically controlled.

One simple way to see geographic variation is to look at the histories of the OFHEO (Office of Federal Housing Enterprise Oversight) HPI (Home Price Index) for multiple cities in the

U.S. (more about this particular index and city selection in a later section). The dotted lines in Exhibit 2 display the maximum and minimum metropolitan area returns experienced each year. Thus, the regional differences are quite significant, even in very strong periods.

Exhibit 2

Housing Returns: A Range of Differences



Source: Office of Federal Housing Enterprise Oversight

The Indexation Problem

First, we take a step back. There are three well-known requirements of a good value index: (1) consistent pricing, (2) comprehensive coverage and (3) being rules-based. To that end, we can safely say that any real estate index cannot fully satisfy all three requirements. Since not all houses trade regularly, we can never really have consistent pricing over time. For the small subset that does trade, there are lengthy settlement times (from agreement to closing), reporting delays (from closing date to public disclosure), and likely human recording errors. Due to small sample size, we cannot have deep coverage.⁴ Therefore, no matter what set of rules an index uses, every index will have some limitations.

What we end up with in all cases is usually a home sales price index on a representative segment. The index, however, cannot measure missed sales, contemplated transactions, or delaying tactics. We do however believe that the law of large numbers⁵ does not need much policing. If smaller homes are more in vogue, that *should* be reflected in the price action. The same holds true for foreclosures, renovations, job displacements and socio-economic shifts. If an impact is truly

⁴By comparison, the investment grade credit indices generally include half of all bonds outstanding.

⁵The law of large numbers states that the population average converges to its true mean as sample size increases.

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isolated, its inclusion should not matter. If an effect is more common, the published index should reflect that trend. Luckily, this also makes index construction and maintenance much easier.

Enter the RPX

RPX was created by Radar Logic Incorporated. Begun in 2003 as Global Skyline, the company evolved into its current form via joint partnerships with Ventana Systems and Miller Samuel. RPX measures housing value in terms of *price per square foot*, or ppsf.⁶ Perhaps the typical homeowner never thinks in terms of ppsf, but there are situations where it becomes quite common and eminently helpful. For example, New York City has many small apartments where slight differences in size can cause huge swings in selling price. Architects and builders also often use ppsf to quote construction costs. Ultimately it is an excellent way to consolidate and compare vastly different sized property on a more even (*square*) footing. Mansions can coexist with studio apartments on a more common playing field, though on potentially different parts of that distribution. Using this 'normalized' index adjusts for homes that have been enlarged in the recent renovation boom, though it may not reflect an upgrading to a gourmet kitchen.

Land acreage can only indirectly affect this pricing measure: two identical houses on different sized lots would have vastly different ppsf values. The extra land would only serve as a "feature" to potentially enhance the walls and floors; it would not explicitly enter calculations. Different municipalities may also have varying rules regarding square footage measurement. There are no adjustments made to each district's official size numbers.

RPX includes covers 25 Metropolitan Statistical Areas (MSAs) – major urban centers used for housing price determinations⁷ and a nationwide composite. This composite uses fixed published weights of the underlying MSAs, with periodic rebalancing (2-3 years) using official census and proprietary data. The index incorporates all residential real estate transactions that take place on that day. This includes existing *and new* condominiums, stand-alone houses, and multi-family homes. Each sale is converted into a ppsf using publicly available data. All closed (i.e., completed) transactions are then fitted to a multi-parameter distribution

with the resulting median becoming that day's index level.⁸ Foreclosures and short-term "flips" are included, but certain non-arm's-length exchanges are eliminated. Every transaction is equally weighted. If a particular region experienced significant anomalous sales, that would be captured in that market's index value.

Case-Shiller Indices

Of all other residential housing indices, the most well known are the S&P/Case-Shiller (SPCS). These were originally developed to cover 20 MSAs and two composites.⁹ SPCS relies on repeat-sales observations on single-family houses; it does not include new home or condominium sales. It also screens out non-arm's-length and severe outlier transactions – thus it potentially filters out properties with major remodels at the upper end and foreclosures at the lower end. Case-Shiller market-weights each sale and also weights transactions (inversely) by the length of time between transfers. Short-term 'flips' are disallowed.

Exhibit 3

How RPX Compares to SPCS

Index	RPX	SPCS
Provider	Radar Logic	MacroMarkets
# MSAs	25	10 or 20
History Inception	2000	1987
Exchange	None	CME
Traded Beginning	Sept 2007	May 2006
Longest Contract	5 Year (Qtrly Cycle)	5 Year (Annual Cycle)
Frequency	Daily	Monthly
Lag or Lookback	63 Days	2 Months
Data Collection Period	1-, 7-, or 28-Days	3 Months
Underlying Concept	Distribution Fitting	Repeat Sales
New Sales	Included	Not Included
Condominiums	Included	Not Included
Foreclosures	Included	Potentially Filtered
Non-Arm's-Length Trade	Not Included	Not Included
Home Holding Period	No Minimum	6 Months Minimum
Transactions Weighted	Equally Weighted	Less for Longer Holding
Additional Filters	Suspected Data Error Missing Data	Suspected Data Error Changed Property Type Substantial Physical Change

Source: Radar Logic, MacroMarkets, Morgan Stanley

This index is traded in derivative form on the Chicago Mercantile Exchange (CME) and has seen about \$350MM in traded notional from its May 2006 inception through June 2007.¹⁰ While contracts were limited to one-year expirations, it should see expansions to five-year contracts around the same

⁶The Radar Logic Index Methodology, Radar Logic, 2007. Data available at www.radarlogic.com.

⁷The Office of Management and Budget, or OMB established MSA definitions.

⁸The shape is determined using 365 days of data, but the median just uses 1 day's data at that assumed shape. Please see The Radar Logic Daily Index (White Paper), Ventana Systems, Inc., Kagarlis, Marios et al. March 28, 2007.

⁹S&P/Case-Shiller Home Price Indices, Standard & Poor's, February 7, 2007. Data is available at www.macromarkets.com.

¹⁰Real Estate Futures Gain Momentum in the U.S., Sausner, Rebecca, US Banker, June 2007.

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time as RPX introduction.¹¹ Since SPCS will most often be compared to RPX, we include a table of differences above in Exhibit 3.

Exhibit 4 lists all of the cities (MSAs) included in either index family. SPCS10 cities appear in all three indices. Note that Dallas and Portland (Oregon) are included only in SPCS20. New York and Chicago MSAs are slightly expanded beyond the official government definitions.

Exhibit 4

Cities Covered by RPX and SPCS

MSA	RPX	SPCS20	SPCS10
Atlanta	✓	✓	
Boston	✓	✓	✓
Charlotte	✓	✓	
Chicago	✓	✓	✓
Cleveland	✓	✓	
Columbus	✓		
Dallas		✓	
Denver	✓	✓	✓
Detroit	✓	✓	
Jacksonville	✓		
Las Vegas	✓	✓	✓
Los Angeles	✓	✓	
Miami	✓	✓	✓
Milwaukee	✓		
Minneapolis	✓	✓	
New York	✓	✓	✓
Philadelphia	✓		
Phoenix	✓	✓	
Portland		✓	
Sacramento	✓		
San Diego	✓	✓	✓
San Francisco	✓	✓	✓
San Jose	✓		
Seattle	✓	✓	
St. Louis	✓		
Tampa	✓	✓	
Washington	✓	✓	✓
Total	25	20	10

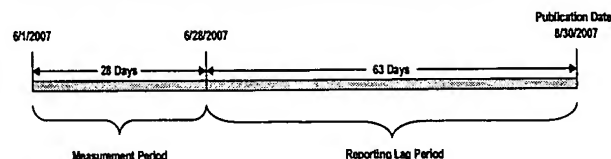
Source: Radar Logic, MacroMarkets, Morgan Stanley

Lags, Lookbacks, and Measurement Periods

Both sets of indices utilize a lag (or lookback) between transaction and publishing dates because of the necessary reporting delays in the industry. Published daily, RPX uses a hard 63-day (7-week) lag and expressly has three index series having 1-, 7-, and 28-day measurement periods for data collection. For example, for the August 30 publication date, all RPX Indices had a transaction date of 6/28/07, and the 28-day lookback version uses data from June 1st through the transaction date.

Exhibit 5

Timeline of RPX Collection to Publication



Source: Radar Logic, Morgan Stanley

By contrast, SPCS announces its new levels only on the last Tuesday of each month on a two-month lag (e.g., August 28th's announcement would be for the June index). SPCS has a 3-month measurement period, so the June index would also include sales that took place in May and April. The longer (and unchangeable) measurement period of SPCS tends to make those indices smoother and less volatile than RPX.

Other Indices of Note

We previously mentioned HPI created by OFHEO, responsible for overseeing Fannie Mae and Freddie Mac. HPI tracks the performance of homes transactions involving conforming conventional mortgages purchased or securitized by the two agencies. The computation utilizes weighted repeated sales similar to SPCS methodology.¹² The maximum conforming loan limit is currently \$417,000 and has grown over the years, quadrupling since 1980. Even if we remove the non-purchase (i.e., refinanced homes) portion of that universe, the remainder focuses principally on the lower priced segment of the market, which is financed via a Government Sponsored Enterprise (GSE). We believe that this size bias keeps the HPI from gaining a foothold as a trading reference, although it should offer a useful pricing point of reference for agency MBS.

The National Association of Realtors builds a Median Sales Price Index on a Quarterly basis, but this does not control for home size substitution. Thus, a rising value may occur simply due to more supply and sales of larger properties. It is based on survey responses of its members capturing only 30-40% of all sales; it also builds in some seasonality adjustments. The drawback here is the relatively small coverage of actual trades.

Summarizing the Index Types

We see three major types of house value indices: (1) return-compounded index levels, (2) median prices, and (3) price per square foot. Of these, we favor the newly introduced RPX (which measures ppsf) for several reasons. It includes the

¹¹Some of these tenors are available only on semi-annual and yearly cycles.

¹²OFHEO Home Price Indexes: HPI Technical Description, Calhoun, Charles, March 1996.

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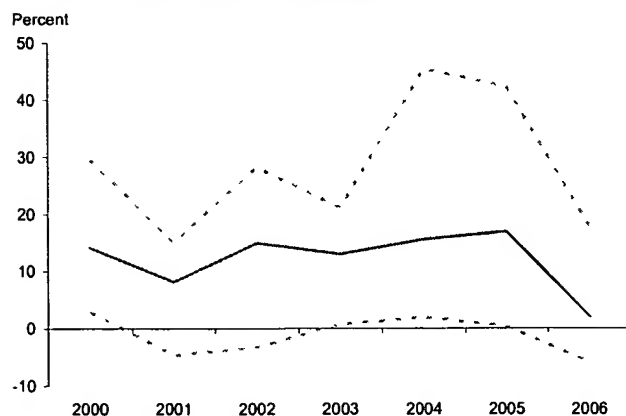
greatest number of real estate transactions, notably new home sales and condos (both of which SPCS lacks). It controls for home size better than median price indices, and it more easily compares homes of different sizes as well as different cities. The return-dependent indices (HPI and SPCS) do not easily measure different MSAs against each other (without some mental or numeric juggling). The RPX also includes foreclosures without filtering. Therefore, in our view, RPX emerges as the best tradable index among the different alternatives.

RPX in the 21st Century

Looking at RPX annual histories from 2000 with proper publishing lags, we see that the overall market has done quite well, with an average yearly return of almost 13% (Exhibit 6). Again it is also clear that most years see a wide range of performance from best to worst MSA. We have seen Las Vegas' spectacular +40% rise in 2004 to several cities' mid-single-digit losses in 2006. San Jose's 5% loss in 2001 resulted from the dot.com fallout, although this figure was small in comparison to some of the losses on stocks.

Exhibit 6

Best to Worst Yearly Returns within RPX



Source: Radar Logic, Morgan Stanley

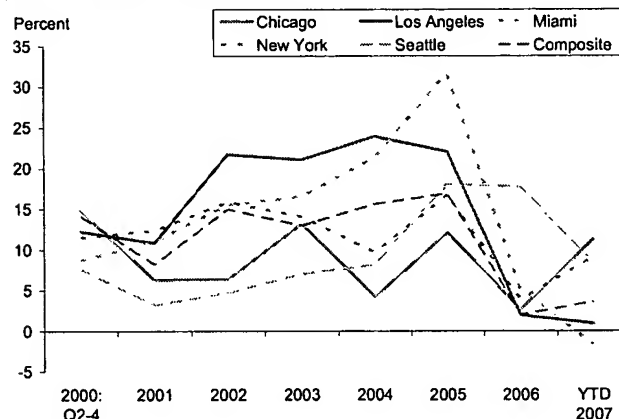
While longer term, we know the overall market disappointed beginning with the 1990 recession for several years, we also saw strong performances in some cities during that same period. Thus, we often see individual negative results with a story behind them. Looking further back in history, we remember the dropping oil prices in the mid-1980s driving down Texas and Oklahoma home values.

Five City Tour

In the beginning of RPX launch, we expect that five MSAs will be more consistently quoted, traded, and marked. New York and Los Angeles represent the top two real estate markets in terms of size. Chicago is the largest non-coastal city in this set. Miami and Seattle allow for rounding out regional exposures in the Southeast and Northwest. This five-city group equals a little over half of the composite index. Its weighted average ppsf is about 10% higher than that of the composite. Exhibit 7 tracks yearly returns for 2000-06. This group performed slightly better than the composite index over that time. The chart includes 2007 through August to show the general slowing of the housing market.

Exhibit 7

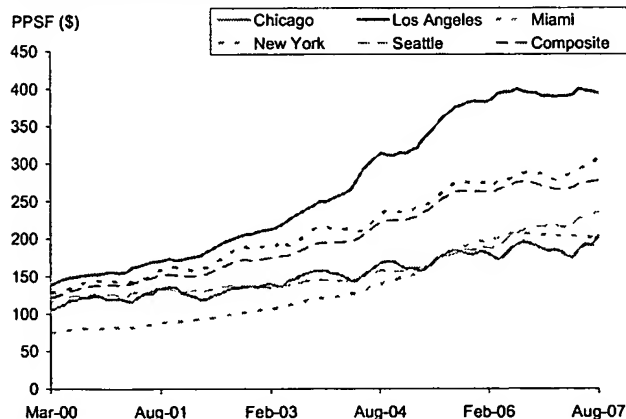
Five MSAs: Total Return



Source: Radar Logic, Morgan Stanley

Exhibit 8

Price per Square Foot: Five MSAs



Source: Radar Logic, Morgan Stanley

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The Exhibit 8 shows monthly ppsf values since early 2000. We see that Los Angeles has the highest value in this group at just under \$400/sf, and New York just beats the national composite level. Watching closely reveals explainable seasonality, especially in the colder (and windier) winter climates. For completeness, we include (in Exhibit 9) a table of current ppsf values for all MSAs covered by RPX.

Exhibit 9

Current PPSF Values for all RPX MSAs

MSA	Bloomberg Ticker	PPSF	RPX Weight
Atlanta	RPX.AT28	104.03	2.4%
Boston	RPX.BO28	245.84	4.5%
Chicago	RPX.CG28	192.57	5.7%
Charlotte	RPX.CH28	100.46	0.6%
Cleveland	RPX.CL28	96.25	0.9%
Columbus	RPX.CO28	100.14	0.7%
Detroit	RPX.DT28	107.11	1.9%
Denver	RPX.DV28	151.14	1.5%
Jacksonville	RPX.JX28	126.48	0.7%
Los Angeles	RPX.LA28	395.18	16.1%
Las Vegas	RPX.LV28	172.47	1.4%
Miami	RPX.MI28	197.13	4.6%
Minneapolis	RPX.MN28	158.54	1.9%
Milwaukee	RPX.MW28	123.41	0.7%
New York	RPX.NY28	305.50	23.1%
Philadelphia	RPX.PH28	158.09	4.1%
Phoenix	RPX.PX28	158.54	2.7%
Sacramento	RPX.SC28	211.67	1.9%
Seattle	RPX.SE28	235.07	3.2%
San Francisco	RPX.SF28	454.96	7.0%
San Diego	RPX.SD28	312.69	3.7%
San Jose	RPX.SJ28	474.59	2.9%
St. Louis	RPX.SL28	95.62	1.2%
Tampa	RPX.TA28	137.43	1.6%
Washington	RPX.DC28	235.54	5.1%
Composite	RPX.CP28	275.95	100.0%

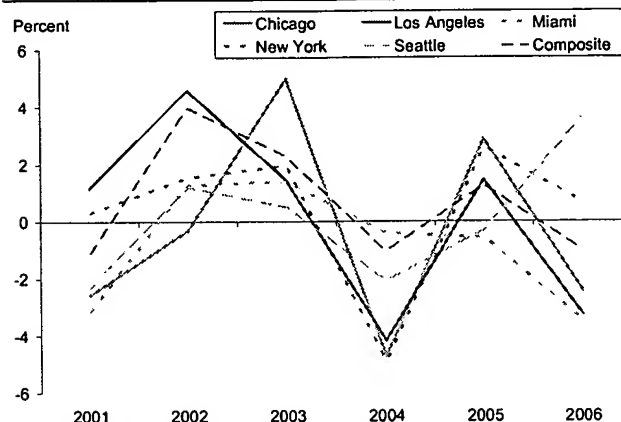
Source: Radar Logic, Morgan Stanley (as published on September 19, 2007)

RPX vs. Case-Shiller Performance

Comparing the annual returns between RPX and SPCS for 2001-06, we find sufficient differences to thwart a 'doesn't matter' shrug (Exhibit 10). The differences in data collection period, new sales, condos, and square footage normalizing definitely make their presence felt, although we would be first to admit that quantifying the effects would take lots more work. It may not be easy to substitute one for the other without much thought.

Exhibit 10

RPX Can Differ Greatly from SPCS



Source: Radar Logic, MacroMarkets, Morgan Stanley

RPX vs. Other Financial Asset Classes

How can we possibly compare real estate with any other asset class? Housing had been on such a tear, especially earlier this decade. We decided to look at total returns of fixed income and equities to make the examination fairer (no hedging of interest rate exposure). In Exhibit 11, we list quarterly return statistics (2000 Q2 – 2007 Q2) for various asset classes. RPX greatly outperformed all other alternatives, but at greater volatility than many. RPX's Sharpe Ratio of 0.71 edges out IG credit by 30 bps and MBS by 25 bps. This is clearly a setup for future musings about optimal asset allocations, and we may see applications to add RPX exposure to multi-asset class portfolios, depending on one's view on real estate. To further establish the setup, we include the Risk/Return diagram in Exhibit 12. We caution to be cognizant of the time period that these data are based on – a period of robust growth in home prices. Further, the volatility of an instrument such as a total return swap based on RPX is likely to be higher than the volatility of the index itself.

Exhibit 11

RPX Performs Against Other Assets (2000-2007)

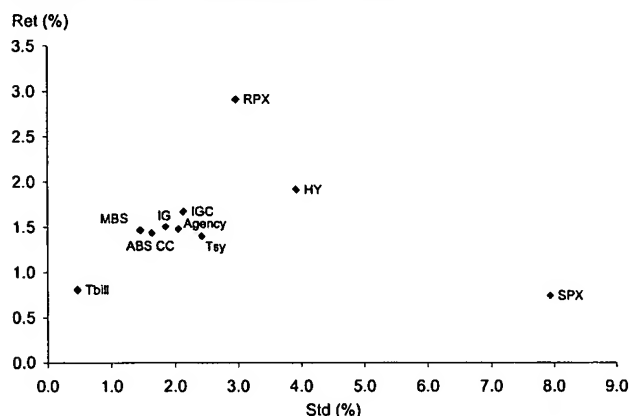
Asset Class	Avg Ret	Std Dev	Sharpe Ratio	RPX Corr
All Investment Grade	1.50%	1.85%	0.37	9.9%
Treasury	1.39%	2.42%	0.24	18.5%
Agency	1.47%	2.05%	0.33	12.8%
Investment Grade Credit	1.66%	2.13%	0.40	-0.3%
Credit Card ABS	1.43%	1.63%	0.38	9.6%
MBS	1.46%	1.45%	0.45	8.2%
T-bill	0.81%	0.47%	-	-15.8%
High Yield Credit	1.91%	3.92%	0.28	-40.7%
S&P 500	0.74%	7.94%	-0.01	-31.3%
RPX	2.90%	2.97%	0.71	100.0%

Source: Radar Logic, Yield Book Analytics, Morgan Stanley (all quarterly results)

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Exhibit 12

RPX Territory in Risk/Return Space



Source: Radar Logic, Yield book Analytics, Morgan Stanley (Quarterly results 2000-2007)

Housing versus Macro

Looking at the longer history of OFHEO's HPI, we see very low correlation with GDP changes. Housing returns were very low in the early 1990s beginning with that recession, but held in nicely during the 2001 recession, remaining in the 7% range for several years. Compared to CPI changes, HPI had a slightly higher correlation over both the longer and shorter term histories. By its low volatility construction, CPI of owner's equivalent rent does not have high correlation to housing prices (it in fact exhibits moderately negative correlation over time). At first blush, it is difficult to see any persistently strong relationships between macro time series and home prices. Perhaps the old rules have changed due to the huge run up in real estate, or we simply have not gone through enough full economic cycles.

Initial RPX Trading Products

In the early stages of RPX introduction, we expect most trading to involve the 28-day aggregation of the composite and five individual MSAs mentioned above (perhaps on an inquiry basis). Settlement values will entail an average of the last 5 days of the month (to reduce the potential for single day volatility) on a calendar quarter cycle. Because of the reporting delay, this means that September 30 contracts use ppsf values near the end of July. The products traded should be both a forward contract and total return swap (TRS) with initial tenors of 1, 2, 3, 4, and 5 years. This compares favorably to what's available with SPCS.

Of the two trading contracts, we expect the TRS to be more popular. The quoting convention will be the fixed rate that is exchanged on a quarterly basis for the return of RPX. Taking

a long position in RPX is the same as being the receiver of that index's return. That party is also the payer of the fixed rate (stated on the offer side). Settlement is done T+3 after quarter's end using the aforementioned last 5-day average index level. The mechanics operate similar to other fixed-to-floating interest rate swap transactions: the buyer (long party) of the index pays one-quarter of the fixed annual rate on the underlying notional amount and receives the quarterly return of RPX on that same notional. The notional amount remains the same for the life of the contract, i.e., quarterly returns are additive. Quoting is also done on a non-compounded annual rate basis, thus 5% annual for 2 years creates a breakeven of 10%, not 10.25%.

Because of the downward expectations on housing returns near term, all quotes are typically negative, so shorting (for example) involves receiving the loss on real estate while paying a fixed rate. This just adds to the confusion of starting a new market, but we believe the advantages will ultimately justify the learning curve.¹³

Who Should Use Property Derivatives?

While we easily picture investors of securitized products trading these new contracts, we can make a case for many other categories of users. Hedge funds, especially with macro-driven strategies, can put real estate views into play particularly with a relative-value perspective, both temporally and geographically. Owners of large residential developments can hedge their exposures and spread geographic risks. Credit and equity portfolio managers can take advantage of diversification. Banks and mortgage lenders can moderate housing impact on their loan portfolios. Mortgage loan originators and servicers are also other potential users. Municipalities can mitigate losses of housing permit and property tax revenues as assessments decline.

Conclusion

With some large investors calling for a steep real estate downturn in 2008, and the continued threat of sub-prime troubles, it is difficult for many to have a view on housing that is not negative. Fortunately, there is now a way to express that view and the degree by which to hold it. There are also many ways to realize performance from relative views, geographically and otherwise. For a \$22 trillion asset class, this is can be huge.

¹³ We will re-visit this topic with a detailed illustration in a future publication.

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(as of Sept 03, 2007)

Rating	Coverage Universe		Investment Banking Clients (IBC)		
	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight	72	37%	44	33%	61%
Equal-weight	77	40%	58	44%	75%
Underweight	44	23%	31	23%	70%
Total	193		133		

Coverage includes all companies that we currently rate. Investment Banking Clients are companies from whom Morgan Stanley or an affiliate received investment banking compensation in the last 12 months.

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